

REMARKS

Formalities

Claims 1-22 are all the claims pending in the application.

The Examiner has objected to claim 21, alleging that the claim language is inconsistent.

As a path of least resistance, Applicants have amended claim 21. Because the amendment is merely stylistic and does not alter the claim scope, no estoppel is inflicted.

In addition, claim 8 has been amended in the same fashion as claim 21.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 9-12 and 14-22 are allowed.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-8 and 13 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hesselbom (US 6,014,313). Applicants respectfully traverse this rejection at least because Hesselbom does not teach or suggest all of the claim recitations.

First, the Examiner has not addressed Applicants' position that claim 1 includes a means-plus function clause that must be construed in accordance with 35 U.S.C. § 112, ¶6. By disregarding this language, the Examiner violates a statutorily mandated interpretation of the clause (DISCUSSION at pp. 8-9 of Applicants' last Response). Therefore, the Examiner is kindly requested to reconsider the rejection of claim 1 after properly construing the statutory requirement.

Also, with respect to independent claim 1, Hesselbom does not teach or suggest an electronic assembly having “a heat removal means” for removing heat from said module via a first face of said module “to the soleplate”, in which the first face of said module is distinct from a second face of said module “that contacts said soleplate.”

Hesselbom teaches a multi-chip module 1 with several integrated circuit chips 3 (cited as corresponding to the electronic module) in mechanical contact with cooling blocks 19. Hesselbom at Fig. 2. The cooling blocks 19 (cited as corresponding to the soleplate) have cooling flanges or fins 33 that are cooled by, for example, air or cooling liquid flowing past the flanges. Hesselbom at 10:35-42. In addition, Hesselbom discusses an alternative embodiment (not shown) in which the channels 35 formed on the sides of the chips 3 can be used for cooling the chips 3 by transporting a cooling medium within a sealed system within the channels 35 to an external condenser. Hesselbom at 11:6-13 & Figs. 1 and 2.

Hesselbom is deficient at least because it does not teach or suggest the claimed “heat removal means.” Although the top/bottom surface (*second face* that contacts soleplate) of the integrated circuit chip 3 of Hesselbom is in contact with the cooling blocks 19 (Hesselbom at Fig. 2), Hesselbom does not describe a heat removal means that removes heat from the integrated circuit chips via a *first face* to the *soleplate*, the *first face* being distinct from the top/bottom

The Examiner appears to allege that the side faces of the chips 3 that delimit the channels 35 correspond to the claimed “first face” and that the cooling medium within the channels 35

corresponds to the claims “heat removal means” (Office Action dated June 18, 2003 at p. 5).

However, the coolant within the channels cannot correspond to the claimed “heat removal means” because it does not perform the claimed function of removing heat from said module via a first face of said module to the soleplate. Hesselbom’s cooling medium instead cools the chip 3 by providing the cooling medium to the *external condenser* of a two-phase system (e.g., an air-conditioning or refrigeration type system).

Even assuming *arguendo* that the cooling medium within the channels is in contact with the cooling blocks, there is no technical basis for assuming that the cooling medium removes heat to the cooling blocks 19. Instead, if the cooling medium were to come into contact with the cooling blocks 19, it is most likely that the heat of the cooling blocks 19 would be removed by the lower temperature cooling medium to the condenser. There is no disclosure in Hesselbom that the temperature of the heated cooling medium is greater than the temperature of the heated cooling blocks.

It is more likely that the temperature of the cooling medium is lower than the temperature of the cooling blocks 19. If this is the case, then the removal of heat from the cooling medium to the cooling blocks 19 would be impossible, since this type of heat transfer is contrary to the second law of thermodynamics.

In addition, Hesselbom does not discuss whether or not the sealed system of the cooling medium actually makes contact with the cooling blocks 19. As such, Hesselbom does not teach

any structure that corresponds to the described structure of the claimed “heat removal means” in the specification, which directly contacts the soleplate. Hesselbom at Fig. 1 & 8:23-24.

In addition, there was no motivation or suggestion for one of ordinary skill in the art at the time of invention to modify Hesselbom’s system so that the heat that is transferred from the side of the chip to the cooling medium is instead transferred to the cooling block 19.

Therefore, Applicants respectfully request the Examiner to withdraw the rejection of independent claim 1 at least because Hesselbom does not teach or suggest the claimed electronic assembly having a “heat removal means” for removing heat from said module via a first face of said module “to the soleplate”, in which the first face of said module is distinct from a second face of said module that contacts said soleplate. In addition, Applicants respectfully request the Examiner to withdraw the rejection of claims 2-8 and 13 at least because of their dependency from claim 1.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.116
US Application No. 09/865,720

Docket No. Q64636
Art Unit 2877

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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